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ENVH 7232 - Water Quality

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Georgia Southern University
Jiann-Ping Hsu College of Public Health

ENVH 7232-A – Water Quality
Spring 2017

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<u>Office Hours</u>	Tuesday&Thursday 11:00 am – 2:00 p.m. or by appointment
<u>Class Hours:</u>	Tuesday 3:30 – 6:30 p.m.
<u>Classroom:</u>	Hendricks Hall, Room 2020
<u>Website:</u>	https://georgiasouthern.desire2learn.com/d2l/home/335004

Prerequisites

None.

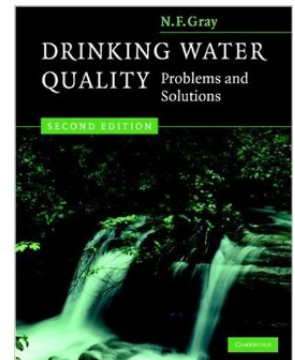
Course Overview

This course is designed for graduate students and it will provide students with an introduction and overview of the key areas of water quality and health. Students will gain an understanding of the physical, chemical and biological principles of water quality, the potential impact on health of water pollution, and local, national and international environmental policies pertinent to water issues along with current treatment and remediation strategies to ameliorate pollution. The major topics include introduction to water quality and health; physical and chemical agents in water, emerging infectious diseases related to water quality, drinking and recreational water quality criteria, drinking and wastewater treatment. In addition, this course will provide analysis of the current topics in global water and health and challenges faced under the changing climate and socio-economic needs. As such, it will examine recent case studies and their outcomes related to environmental policy and management implications.

Required Textbook

Gray, N. F. (2008).

Drinking Water Quality: Problems and Solutions,
SECOND EDITION.
Cambridge University Press, 520 pp.
ISBN: 978-0-521-70253-9



Additional Reading

Grayman, Loucks and Saito (2012) *Toward a Sustainable Water Future: Visions for 2050*

<http://dx.doi.org/10.1061/9780784412077>

Allan, T. (2011) *Virtual Water*. I. B. Tauris, London, 365 pp.

Hoffman, S. (2009) *Planet Water*. John Wiley & Sons, New Jersey, 352 pp.

Pearce, F. (2006) *When the Rivers Run Dry*. Beacon Press, Boston, 324 pp.

Diamond, J. (2005) *Guns, Germs, and Steel*. WW Norton, New York, 518 pp.

MPH Core Student Learning Outcomes (CORE):

1. Demonstrate proficiency and effectiveness in the communication of core public health principles and practices, both oral and written.
2. Demonstrate proficiency in the integration of the core public health disciplines (Biostatistics, Epidemiology, Environmental Health, Health Policy/Management, and Social/Behavioral Science) in practice and research.
3. Demonstrate proficiency in problem solving, critical thinking, and public health leadership.

MPH Environmental Health Sciences Student Learning Outcomes (ENVH)

1. Select and apply investigative appropriate tools to measure environmental hazards and associated health outcomes, particularly in the context of rural and underserved areas.
2. Conduct environmental health research and translate into public health interventions using appropriate research designs and evidence based analytic techniques.
3. Employ and evaluate the principles and practices of environmental exposure assessment to address community risk, and effectively communicate the risk to all stakeholders.
4. Analyze and apply the outcomes of environmental impact studies to prevent, mitigate and/or predict future environmental hazard exposures, to support and promote health policy development.
5. Assess and communicate how cultural, socio-economic, and behavioral factors may influence the risk of exposure to environmental hazards and related health outcomes, particularly in the context of rural and underserved populations.
6. Communicate environmental health principles and concepts to lay and professional audiences through both oral and written communication.

MPH Core Competencies in Environmental Health Sciences

Upon graduation, a student with an MPH degree should be able to:

1. Describe major environmental health hazards (physical, chemical and biological), and assess their genetic, physiologic, and socio-economic impacts on vulnerable and susceptible populations with special emphasis on rural and underserved communities.
2. Apply research ethics and current research principles, including hypothesis generation, experimental design, and current research methodology, to the qualitative and quantitative measurement and analysis of environmental stressors on human health and ecosystems.
3. Apply the outcomes of environmental monitoring and environmental impact assessments to prevent, mitigate and/or forecast future exposures to environmental hazards and utilize this information to support or advocate for environmental health policy development.

4. Demonstrate current health risk assessment methods, directed toward management of environmental hazards and provide technical assistance and leadership to address the concerns of communities including environmental justice and equity; as utilized by federal, state, and local regulatory programs, and non-governmental guidelines and authorities.
5. Communicate about environmental health hazards and associated health outcomes to community, stakeholders and professional audiences through oral and written communication and within the appropriate community-based intervention studies.

Performance-Based Objectives Linked to Course Activities (Note: Activities Described in Next Section)

1. Students will demonstrate competence in the basic terminology associated with water quality. (Activity 1)
2. Students will demonstrate the ability to integrate applications of water quality principles. (Activity 2)
3. Students will demonstrate competence in the ability to assess the fundamentals of current research in water quality. (Activity 3)
4. Students will demonstrate the ability to communicate water quality concepts through writing to professional audiences. (Activity 4)
5. Students will demonstrate the ability to communicate water quality concepts through presentation to professional audiences. (Activity 5)

Assessment of Student Learning

1. Activity 1: Use course lectures, in-class and online discussions to explain the basic terminology and definitions of water quality, including, but not limited to, infectious diseases, waterborne pathogens, chemical pollutants, emerging waterborne diseases, water treatment. Competence in basic terminology will be evaluated using three activities: (1) five online quizzes and (2) mid-term exam (3) final exam.
2. Activity 2: Use course lectures, online and class discussions, and case studies to major physical and chemical pollutants and emerging infectious diseases transmitted by contaminated water and compare approaches for assessing, preventing and controlling these water borne hazards locally and globally. Competence in the ability to integrate concepts will be evaluated using three activities: (1) five online quizzes, (2) laboratory reports, (3) mid-term exam (4) final exam.
3. Activity 3: Use course lectures, online and in-class discussions to demonstrate competence in the ability to utilize water quality principles and concepts to prevent and mitigate existing and emerging waterborne pollutant exposures. Competence in the ability to integrate concepts will be evaluated using three activities: (1) weekly discussions on current environmental health events, (2) five online quizzes and (3) writing assessment through three research reports analyzing water quality issues published in peer-reviewed journal articles.
4. Activity 4: Competence in written communication to the professional audience will be evaluated using (1) a one comprehensive review (6000 words) of an assigned water quality

- topic , and (2) on-line discussions..
5. Activity 5: Competence in oral presentation to the professional audience will be evaluated using (1) the preparation and delivery of a presentation of the comprehensive review and (2) in class discussions.

Instructional Methods

The course meets twice a week for one hour and fifteen minutes. The way we use this time will vary, and will include lectures, guest lectures, article discussions, documentaries, in-class exercises, and student-led presentations. Discussion and debate of course material is crucial for success in the course. Therefore, students are required to read all material assigned for the class and to come to class prepared to discuss the assigned readings.

Expectations

This course will involve the completion of a number of oral and written assignments. Students will be responsible for leading the discussion about the reading assignment. Writing as a means of effective communication, argumentation, and presentation of ideas is extremely important as a public health professional, or a professional of any sort. It is expected that students will turn in assignments that express their ideas thoughtfully, with attention to organization, spelling, and grammar.

In addition, proper citation and quotation of references in writing is absolutely critical, and failure to do so can have serious repercussions both in the academic and professional realms. Failure to give credit as required by APA standards will result in a failing grade on assignments.

If you have questions about citation, please seek help from Dr. Aslan or another source. If you would like assistance in developing your writing skills, the University Writing Center (871-1413) is an excellent resource.

The assignments will be accounting for 50% of your overall course evaluation.

The course is structured along three lines of activity: (1) Weekly discussions to help you build a knowledge base of water quality and health and (2) Hands-on field and laboratory experience to give you a chance to connect the readings with your existing knowledge, (3) Literature review and presentation to get you grounded in existing research practice on topics of your interest.

The course grade will be determined through a combination of summative examinations (quizzes, mid-term and final), laboratory reports, and a final paper accompanied by a presentation to your peers at the end of the semester.

1. Weekly assignments

Students are expected to participate in class discussion of the topics listed on the syllabus, basing their participation on the assigned readings and/or media. As a consequence, weekly assignments must be completed prior to the class session. All assignments will be available online at Folio. Each class will be led by discussants that are assigned at the beginning of the semester.

Students are also asked to read a major newspaper with substantial environmental health reporting daily. The first few minutes of each class will be devoted to breaking news relevant to global environmental health issues. The New York Times Health and BBC Health sections are available online for free daily and there are other free online sources at the news sections or home pages of organizations such as AAAS, WHO and CDC.

Discussions will be accounting for 10% of your overall course evaluation.

2. Laboratory Reports

There will be three hands-on field and laboratory based activities during the semester. Laboratory reports produced at the end of these activities will give the students a chance to reflect their knowledge on the material covered.

The purpose of these reports is to improve your technical writing skills. Laboratory reports (three in total) will be accounting for 6% of your overall course evaluation. A separate instruction material for writing the laboratory reports will be provided by Dr. Aslan during the semester.

3. Literature Review and Presentation

Final paper (Literature Review, 6000 words, typed and double spaced)

Each student will be required to write a substantial review paper of approximately 6000 words plus references, typed and double spaced, written with fonts Times New Roman 12pt or Arial 10pt. A variety of topics will be provided by Dr. Aslan and the topic will be selected by the student from these options, in consultation with the instructor, in line with the learning objectives. **Successful papers will be selected to be submitted for publication in peer-reviewed journals at the end of the semester.**

The final paper (literature review) will be accounting for 20% of your overall course evaluation.

Presentation (20 min, followed by Q/A for 10 min)

All students will complete an oral presentation of their final review paper at the end of the course. The presentations will be at the last meeting of the semester. Students can select to use any presentation tool available (Powerpoint, Prezi or any other tool that you know for sure that it will work on the classroom computer). Guidelines for preparing the presentations will be provided by Dr. Aslan during the semester.

The presentation will be accounting for 15% of your overall course evaluation.

4. Examinations

There will be two exams (mid-term and final examinations), each accounting for 20% and 25% of your overall course evaluation respectively. In addition, there will be four quizzes during the semester.

Please note that; for all exams and any hand-written assignments, please make certain that your hand-writing is legible. If I cannot read it, I cannot judge it accurately.

Assessments are linked to the learning objectives for this class. Each assessment below is linked to the course learning objectives (1-6) on page 3 of this syllabus. Weighting of assignments for purposes of grading is described in Table 1.

Table 1. Determinants of grades.

	Topics covered	Quantity	Points	Percentage
Mid-Term	Week 1-6	1	100	20%
Final	Week 1-14 (with 60% emphasis on Week 7-14)	1	100	25%
Quizzes	All previous topics	4	100 ea	4%
Lab reports	Field and lab work	3	100 ea	6%
Discussion participation	All activities in the classroom	n/a	100	10%
Final paper	Student will select the topic from a variety of topics provided by the instructor	1	100	20%
Presentation	Podium presentation of the final paper topic	1	100	15%
Total				100%

n/a: Not applicable

The following point scale will be utilized in grading:

90%-to-100%	A
80%-to-89%	B
70%-to-79%	C
60%-to-69%	D
Below 60%	F

For calculation of your final grade, all grades above will be included and posted on Folio.

There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such circumstances, and/or if you need additional time to satisfactorily complete any course requirement, please consult with the instructor within a reasonable amount of time. *Please note that* the extensions are not guaranteed and will be granted solely at the discretion of the instructor.

Policies

Course Policies

Attendance

Federal regulations require attendance be verified prior to distribution of financial aid allotments. Attendance is mandatory at all class meetings. Absences for any reason that is non-life threatening will result in a deduction of a letter grade as well as loss of quiz/test/participation points assigned to that class meeting.

Class Participation

You are expected to participate actively in class discussion in a collegial manner. Class participation is measured by the frequency and quality of your thoughtful contributions to class discussion. You may use a laptop computer during class for class-related purposes only. Using computers or any other electronic devices for purposes not related to class (e.g. checking emails, Facebook, etc) will result in a significant reduction in your participation grade. If the problem persists, I will ban the use of computers in the classroom.

Assignments

This is a graduate course where knowledge and critical thinking skills must be developed at a higher level than an undergraduate course. **Students MUST keep up with the readings for each week.** That means students in this course should be prepared for reading a chapter per week, plus supplemental readings, plus assignments such as discussions, lab reports, and exams.

Course materials will be posted to the Folio site, the week before they are scheduled in the syllabus. Please check the Folio website **regularly**.

All written work uses APA, 6th edition guidelines for reference citing. See <http://www.apastyle.org/>. For those of you who may need assistance with improving your writing for assignments, the data analysis project, or for general writing, I encourage you to visit the University Writing Center. To learn more, visit their website: <http://class.georgiasouthern.edu/writingc/>.

Due Day

All work and peer critiques to be posted on the course website by the end of **Friday, 10:00 pm the week the assignment is due**. See the course schedule below and the activity guidelines. After uploading any attachments, you should download the file to ensure the file can be accessed. If you experience technical difficulties that prevent you from submitting your work/critiques by the assigned date, you must inform me via email me before the due date (10 pm). For technical assistance contact: Center for Academic Technology Support (912) 478-0882 or cats@georgiasouthern.edu. The center also provides Live Chat for quick questions too. (Hours: M-Th 7:30am-9pm; F 7:30am-5pm; Su 4-9pm).

Extra Credit

No individual extra credit is allowed or will be given in this course. Graduate students are expected to utilize best effort on all assignments, graded examinations, and intellectual challenges (papers, discussions, presentations) and so forth.

Exam Make-ups

Make-ups for quizzes and exams are generally not possible due to the infrequency of class meetings, unless extenuating and serious circumstances (at the discretion of the instructor) are present.

Response time

I try to provide timely feedback on your work within 1-3 days. Feedback will be found in the Discussions menu link where you posted your work. A reply box will contain my feedback. Changes in response time (e.g., conference attendance) will be communicated through email and online announcements. I am online during the semester for much of the day, but sporadically on weekends.

Tardy/Late Policy

I expect students to be present when class starts. I always start on time so you need to be in your seat & ready to go by 3:30. Late arrivals (anything beyond the first 10 minutes of class) will not be added to the attendance sheet. **Late assignments will receive a zero grade if turned in past due.**

University Policies

Academic Integrity

The instructor believes that the conduct of a student registered or taking courses in the JPHCOPH should be consistent with that of a professional person. Courtesy, honesty, and respect should be shown by students toward faculty members, guest lecturers, administrative support staff, and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for their ideas and opinions and striving to help them achieve maximum benefits from their experience in the JPHCOPH.

Please adhere to the strictest academic standards of conduct noted in the GSU *Student Conduct Code* and the *Undergraduate & Graduate Catalog*. Familiarize yourself with University's policies. Enrollment in this course is an implied contract between you and the instructor. Academic integrity relates to the appropriate use of intellectual property. The syllabus and all materials presented and/or distributed during this course are protected by copyright law. You are authorized to take notes, but that authorization extends only to making one set of notes for personal (and no other) use. Students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without written permission of the instructor.

Student academic misconduct refers to behavior that may include plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials (including library materials), and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student's own effort. Reference sources should be indicated clearly. The use of assistance from other students or aids of

any kind during a written examination, except when the use of aids such as electronic devices, books or notes has been approved by an instructor, is a violation of the standard of academic conduct.

Intellectual Property

In accordance with the Georgia Board of Regents, Georgia Southern University has adopted a specific set of policies regarding intellectual property created by students and faculty during their time at Georgia Southern University. This document can be found at:

<http://welcome.georgiasouthern.edu/president/intpropol.htm>

Plagiarism:

According to the Academic Dishonesty Policy of GSU, Plagiarism includes (but is not limited to):

- A. Directly quoting the words of others without using quotation marks or indented format to identify them.
- B. Using published or unpublished sources of information without identifying them.
- C. Paraphrasing material or ideas without identifying the source.
- D. Unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic material.

If you are accused of plagiarism by a JPHCOPH, the following policy, as per the Judicial Affairs website (<http://students.georgiasouthern.edu/judicial/faculty.htm>) will be enforced:

PROCEDURES FOR ADJUDICATING ACADEMIC DISHONESTY CASES

The following protocol has been established to provide students with due process.

A. First Offense - In Violation Plea

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is a first violation of academic dishonesty. The incident will be reported via the following website: <http://students.georgiasouthern.edu/judicial/faculty.htm>
2. If it is a first violation, the professor should talk with the student about the violation. If the student accepts responsibility in writing and the professor decides to adjudicate the case, the following procedures will be followed:
 - a. The student will be placed on disciplinary probation for a minimum of one semester by the Office of Judicial Affairs.
 - b. The student will be subject to any academic sanctions imposed by the professor (from receiving a 0 on the assignment to receiving a failing grade in the class).
 - c. A copy of all the material involved in the case (Academic Dishonesty Report Form and the Request For Instructor to Adjudicate Form) and a brief statement from the professor concerning the facts of the case and the course syllabus should be mailed to the Office of Judicial Affairs for inclusion in the student's discipline record.

B. First Offense - Not In Violation Plea (student does not admit the violation)

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to

determine if this is the first or second violation of academic dishonesty. The student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case. If the student is found responsible, the following penalty will normally be imposed:

- a. The student will be placed on Disciplinary Probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor.

C. Second Violation of Academic Dishonesty

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, and if it is determined this is the second violation, the student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case.
2. If the student is found responsible, the following penalty will normally be imposed:
 - a. Suspension for a minimum of one semester or expulsion.
 - b. The student will be subject to any academic sanctions imposed by the professor.

NOT RESPONSIBLE FINDING

When a student is found not responsible of academic dishonesty, the work in question (assignment, paper, test, etc.) would be forwarded to the Department Chair. It is the responsibility of the Department Chair to ensure that the work is evaluated by a faculty member other than the individual who brought the charge and, if necessary, submit a final grade to the Registrar. For the protection of the faculty member and the student, the work in question should not be referred back to the faculty member who charged the student with academic dishonesty. In the case of a Department Chair bringing charges against a student, an administrator at the Dean's level will ensure that the student's work is evaluated in an appropriate manner.

Academic Handbook

Students are expected to abide by the Academic Handbook, located at:
<http://students.georgiasouthern.edu/sta/guide/>.

Failure to comply with any part of this Handbook may be a violation and thus, you may receive an F in the course and/or be referred for disciplinary action.

University Calendar for the Semester

The University Calendar is located with the semester schedule, and can be found at:
<http://www.collegesource.org/displayinfo/catalink.asp>.

Attendance Policy

Attendance the first day of class is **mandatory** per University policy. Federal regulations require attendance be verified prior to distribution of financial aid allotments.

Accommodations

Georgia Southern University is an Equal Opportunity and Affirmative Action institution committed to providing reasonable accommodations for any person with a disability who meets the definition of disabled as described in the Americans with Disabilities Act. Students requiring academic

accommodation should contact the Director of the Student Disability Resource Center for assistance at 912.871.1566 or TDD: 912.478.0666. Students requiring academic accommodation should also *notify the instructor no later than the third class meeting* in the semester.

Disclaimer

The contents of this syllabus are as complete and accurate as possible. I reserve the right to modify the syllabus and schedule to adjust for changing conditions and student needs. Updates will be emailed and posted on the website. I will make every effort to inform you of changes as they occur. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course. You are responsible for any material covered or distributed online, including any announcements, so please check the course website in Folio **regularly**.

Tacit Approval

Review this document carefully and ensure that you understand the course policies, procedures, tentative course structure, and grading schema. Remaining in the course implies tacit agreement to the policies and procedures detailed in this syllabus.

Tentative Overview of Course Content

Week	Date	Topic	Assignment	Assessment
1	01/09/18	Course introduction Syllabus overview	Syllabus Final paper topics	
		Introduction to Water Quality		
01/23/18 Final Paper Topic Selection DUE 10:00 PM				
2	01/16/18	Regulations/Water Sources	Chapters 2 and 4	
3	01/23/18	Inorganic Chemicals in Water: Salts and Metals	Chapters 5 and 9	
		Inorganic Chemicals in Water: Total solids and Radionuclides	Chapters 10 and 12	Clean Water Act Presentation
01/27/18 Final Paper Outline DUE 10:00 PM				
4	01/30/18	Organic Chemicals in Water: Pesticides	Chapter 6	
		Organic Chemicals in Water: Xenobiotics Nuisance	Chapters 7, 8 and 11	Quiz #1 Safe Drinking Water Act Presentation
5	02/06/18	Waterborne Diseases: Viruses	Microbiology of Waterborne Diseases Ch 27 Water and Health Hep A and E	

Week	Date	Topic	Assignment	Assessment
6	02/13/18	Waterborne Diseases: Bacteria	Microbiology of Waterborne Diseases Ch 6 Water and Health Ch5	Working definitions One sentence summary
7	02/20/18	Waterborne Diseases: Protozoa	Article reading	MIDTERM EXAM
8	02/27/18	Drinking Water Treatment, Alternatives to tap water/water security	Chapters 14, 17, 18, 29 and 30	Quiz #2
9	03/06/18	Problems arising from distribution network	Chapters 20-23&24- 28	Chapter Discussants Deonte Martin Imaobong Ekpo Jamira Britt
03/13-03/17/17 SPRING BREAK-NO CLASSES				
10	03/20/18	Recreational Water Quality	Article reading	Recreational Water Criteria Group Presentation Quiz #3
		Guest Speaker: Elizabeth Cheney, Department of Natural Resources/ Field Trip- Statesboro Wastewater Treatment Plant		

Week	Date	Topic	Assignment	Assessment
11	03/27/18	Field Sampling and Lab Analysis		Lab Report #1
	03/28/18	Read results		Lab Report #2
12	04/03/18	Data analysis in water quality		Lab Report #3
13	04/10/18	Emerging Issues in Water Quality	Article reading	Quiz #4
14	04/17/18	Final presentations		
15	04/24/18	Final paper preparation-Schedule a meeting with the instructor		
04/28/18 Final paper SUBMISSION DUE 10:00 PM				
16	05/01/18	Final exam (In Class)		3:00 pm-5:00 pm Hendricks Hall